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Two-pass Weed Management Programs in Corn

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Abstract
The purpose of this study was to evaluate various herbicides for corn injury and weed control when applied preemergence and postemergence.

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Two-pass Weed Management Programs in Corn

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Introduction

The purpose of this study was to evaluate various herbicides for corn injury and weed control when applied preemergence and postemergence.

Materials and Methods

The study was established using a randomized complete block design with three replications. Herbicides were applied in 20 gallons of water/acre. The crop rotation was corn following soybean. The pre-plant seedbed was prepared with a field cultivator. Corn was planted at 35,077 seeds/acre in 30-in. rows on May 17. Preemergence (PRE) treatments were applied on May 18. Postemergence (POST) treatments were applied on June 11. Corn growth was V3 to V4 and 4–8 in. tall. Weeds were generally 0.25–3 in. tall. Weed species in the study included: giant foxtail, velvetleaf, common waterhemp, and common lambsquarters with average populations of <1–3 plants/ft^2. Visual estimates of corn injury and percentage weed control were made during the growing season. These observations were compared with an untreated control and made on a 0–100 rating scale (0 percent = no control or injury; 100 percent = complete control or crop kill). Corn yields were adjusted to 15.5 percent moisture.

Results and Discussion

Summarized in Tables 1 through 4 are the results of the study. PRE treatments resulted in no corn injury (data not shown). PRE treatments gave 88 to 95 percent giant foxtail control on June 11 (Table 1). PRE applied Harness Xtra, TripleFLEX, Dual II Magnum, and Bicep II Magnum gave 22 to 80 percent velvetleaf control, while remaining treatments gave 86 to 99 percent control. PRE treatments gave excellent common waterhemp and common lambsquarters control on June 11 ranging from 93 to 99 percent. PRE applied Dual II Magnum was an exception, providing 75 to 88 percent common waterhemp control and 37 to 48 percent common lambsquarters control.

POST treatments resulted in 0–5 percent corn injury on June 18, 7 days after application (Table 2). Nearly all treatments, with the exception of PRE applied Dual II Magnum followed by POST applied Impact plus Atrazine gave 98 percent or higher weed control on June 18. Weed control was 87 percent or higher with all treatments on June 30, 19 days after POST application timing (Table 3). By July 15, 34 days after POST application timing, nearly all treatments continued to give 88 percent or higher weed control (Table 4). An exception was PRE applied Harness Xtra followed by POST applied Roundup PowerMAX which gave 75 percent velvetleaf control.

Corn yields with the treatments, including the untreated control, ranged between 182 to 250 bushels/acre (Table 4). Significant differences in yield between herbicide treatments were determined. All herbicide treatment yields were significantly higher than the untreated control.

Acknowledgements

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Table 1. Two-pass weed management programs in corn in early June.

Treatment	Rate	Appln timing	Injury Jun 11	Setfa[e] Jun 11	Abuth Jun 11	Amata Jun 11	Cheal Jun 11
	product/acre		- (%) -	------- (% weed control) --------			
Untreated	-	-	0	0	0	0	0
Corvus + Atrazine + (Laudis + Roundup PowerMAX + AMS[a])	3.0 fl oz + 1.0 qt + (3.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	93	99	98	99
Corvus + Atrazine + (Ignite 280 + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	93	98	98	99
Corvus + Atrazine + (Roundup PowerMAX + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	93	98	99	99
Balance Flexx + Atrazine + (Laudis + Roundup PowerMAX + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	93	96	99	99
Balance Flexx + Atrazine + (Laudis + Ignite 280 + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	93	98	99	99
Balance Flexx + Atrazine + (Roundup PowerMAX + AMS)	4.5 fl oz + 2.0 pt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	95	99	99	99
Lumax + (Touchdown Total + AMS)	1.5 qt + (24.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	90	95	95	99
Lumax + (Halex GT + NIS[b] + AMS)	1.0 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	88	92	93	99
Harness Xtra + (Roundup PowerMAX + AMS)	1.2 qt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	93	55	98	99
Verdict + (Status + Roundup PowerMAX + AMS)	16.0 fl oz + (2.5 oz wt + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	95	95	99	99
TripleFLEX + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	93	80	98	99
Dual II Magnum + (Halex GT + Atrazine + NIS + AMS)	1.0 pt + (3.6 pt + 1.0 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	88	30	88	48
Bicep II Magnum + (Halex GT + NIS + AMS)	1.3 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	92	60	99	99
Lexar + (Halex GT + NIS + AMS)	1.5 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	90	98	98	99
Dual II Magnum + (Impact + Atrazine+ MSO[c] + UAN 28%)	1.0 pt + (0.75 fl oz + 1.0 pt + 1.0 % v/v + 2.5 % v/v)	PRE + (POST)	0	90	22	75	37
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[d])	2 pt + 1.1 qt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	93	86	99	99
LSD (P=0.05)			0	4	10	10	11

[a]AMS = ammonium sulfate fertilizer from United Suppliers.

[b]NIS = non-ionic surfactant (Preference) from Winfield Solutions, LLC.

[c]MSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.

[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 2. Two-pass weed management programs in corn in mid June.

Treatment	Rate	Appln timing	Injury Jun 18	Setfa[e] Jun 18	Abuth Jun 18	Amata Jun 18	Cheal Jun 18
	product/acre		- (%) -	------- (% weed control) --------			
Untreated	-	-	0	0	0	0	0
Corvus + Atrazine + (Laudis + Roundup PowerMAX + AMS[a])	3.0 fl oz + 1.0 qt + (3.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	2	99	99	99	99
Corvus + Atrazine + (Ignite 280 + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	99	99	99	99
Corvus + Atrazine + (Roundup PowerMAX + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	99	99	99	99
Balance Flexx + Atrazine + (Laudis + Roundup PowerMAX + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	99	99	99	99
Balance Flexx + Atrazine + (Laudis + Ignite 280 + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	99	99	99	99
Balance Flexx + Atrazine + (Roundup PowerMAX + AMS)	4.5 fl oz + 2.0 pt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	99	99	99	99
Lumax + (Touchdown Total + AMS)	1.5 qt + (24.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lumax + (Halex GT + NIS[b] + AMS)	1.0 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	5	99	99	98	99
Harness Xtra + (Roundup PowerMAX + AMS)	1.2 qt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Verdict + (Status + Roundup PowerMAX + AMS)	16.0 fl oz + (2.5 oz wt + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	5	99	99	99	99
TripleFLEX + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Dual II Magnum + (Halex GT + Atrazine + NIS + AMS)	1.0 pt + (3.6 pt + 1.0 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	5	99	99	99	99
Bicep II Magnum + (Halex GT + NIS + AMS)	1.3 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	5	99	99	99	99
Lexar + (Halex GT + NIS + AMS)	1.5 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	5	99	99	99	99
Dual II Magnum + (Impact + Atrazine+ MSO[c] + UAN 28%)	1.0 pt + (0.75 fl oz + 1.0 pt + 1.0 % v/v + 2.5 % v/v)	PRE + (POST)	5	99	95	96	99
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[d])	2 pt + 1.1 qt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	99	99	99	99
LSD (P=0.05)			1	0	0	1	0

[a]AMS = ammonium sulfate fertilizer from United Suppliers.

[b]NIS = non-ionic surfactant (Preference) from Winfield Solutions, LLC.

[c]MSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.

[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 3. Two-pass weed management programs in corn in late June.

Treatment	Rate	Appln timing	Injury Jun 30	Setfa[e] Jun 30	Abuth Jun 30	Amata Jun 30	Cheal Jun 30
	product/acre		- (%) -	------- (% weed control) --------			
Untreated	-	-	0	0	0	0	0
Corvus + Atrazine + (Laudis + Roundup PowerMAX + AMS[a])	3.0 fl oz + 1.0 qt + (3.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	90	99	99	99
Corvus + Atrazine + (Ignite 280 + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	93	98	98	99
Corvus + Atrazine + (Roundup PowerMAX + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	90	99	88	99
Balance Flexx + Atrazine + (Laudis + Roundup PowerMAX + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	92	99	99	99
Balance Flexx + Atrazine + (Laudis + Ignite 280 + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	0	92	99	99	99
Balance Flexx + Atrazine + (Roundup PowerMAX + AMS)	4.5 fl oz + 2.0 pt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	0	90	99	99	99
Lumax + (Touchdown Total + AMS)	1.5 qt + (24.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	96	99	98	99
Lumax + (Halex GT + NIS[b] + AMS)	1.0 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	98	99
Harness Xtra + (Roundup PowerMAX + AMS)	1.2 qt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	96	87	99	99
Verdict + (Status + Roundup PowerMAX + AMS)	16.0 fl oz + (2.5 oz wt + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	98	99	99	99
TripleFLEX + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	0	96	98	99	99
Dual II Magnum + (Halex GT + Atrazine + NIS + AMS)	1.0 pt + (3.6 pt + 1.0 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	98	99	99	99
Bicep II Magnum + (Halex GT + NIS + AMS)	1.3 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Lexar + (Halex GT + NIS + AMS)	1.5 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	0	99	99	99	99
Dual II Magnum + (Impact + Atrazine+ MSO[c] + UAN 28%)	1.0 pt + (0.75 fl oz + 1.0 pt + 1.0 % v/v + 2.5 % v/v)	PRE + (POST)	0	95	99	96	99
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[d])	2 pt + 1.1 qt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	0	95	95	99	99
LSD (P=0.05)			0	5	3	8	0

[a]AMS = ammonium sulfate fertilizer from United Suppliers.

[b]NIS = non-ionic surfactant (Preference) from Winfield Solutions, LLC.

[c]MSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.

[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.

Table 4. Two-pass weed management programs in corn in mid July.

Treatment	Rate	Appln timing	Setfa[e] Jul 15	Abuth Jul 15	Amata Jul 15	Cheal Jul 15	Yield Oct 21
	product/acre		------- (% weed control) --------				bu/acre
Untreated	-	-	0	0	0	0	182
Corvus + Atrazine + (Laudis + Roundup PowerMAX + AMS[a])	3.0 fl oz + 1.0 qt + (3.0 fl oz + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	88	99	98	99	235
Corvus + Atrazine + (Ignite 280 + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	92	98	95	99	250
Corvus + Atrazine + (Roundup PowerMAX + AMS)	3.0 fl oz + 1.0 qt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	88	98	95	99	232
Balance Flexx + Atrazine + (Laudis + Roundup PowerMAX + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	90	99	99	99	222
Balance Flexx + Atrazine + (Laudis + Ignite 280 + AMS)	3.0 fl oz + 2.0 pt + (3.0 fl oz + 22.0 fl oz + 3.0 lb)	PRE + (POST)	88	99	96	99	247
Balance Flexx + Atrazine + (Roundup PowerMAX + AMS)	4.5 fl oz + 2.0 pt + (22.0 fl oz + 3.0 lb)	PRE + (POST)	88	99	95	99	243
Lumax + (Touchdown Total + AMS)	1.5 qt + (24.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	95	99	98	99	231
Lumax + (Halex GT + NIS[b] + AMS)	1.0 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	99	99	98	99	243
Harness Xtra + (Roundup PowerMAX + AMS)	1.2 qt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	93	75	98	99	217
Verdict + (Status + Roundup PowerMAX + AMS)	16.0 fl oz + (2.5 oz wt + 22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	98	98	99	98	241
TripleFLEX + (Roundup PowerMAX + AMS)	2.0 pt + (22.0 fl oz + 8.5 lb/100 gal)	PRE + (POST)	95	98	96	99	244
Dual II Magnum + (Halex GT + Atrazine + NIS + AMS)	1.0 pt + (3.6 pt + 1.0 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	96	99	98	99	250
Bicep II Magnum + (Halex GT + NIS + AMS)	1.3 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	99	99	99	99	235
Lexar + (Halex GT + NIS + AMS)	1.5 qt + (3.6 pt + 0.25 % v/v + 8.5 lb/100 gal)	PRE + (POST)	98	99	99	99	247
Dual II Magnum + (Impact + Atrazine+ MSO[c] + UAN 28%)	1.0 pt + (0.75 fl oz + 1.0 pt + 1.0 % v/v + 2.5 % v/v)	PRE + (POST)	95	96	94	99	237
SureStart + Atrazine + (Durango DMA + N-Pak AMS Liquid[d])	2 pt + 1.1 qt + (24.0 fl oz + 2.5 % v/v)	PRE + (POST)	92	88	98	99	230
LSD (P=0.05)			6	6	6	1	24

[a]AMS = ammonium sulfate fertilizer from United Suppliers.

[b]NIS = non-ionic surfactant (Preference) from Winfield Solutions, LLC.

[c]MSO = modified vegetable oil and surfactant (Concentrate) from Loveland Products, Inc.

[d]N-Pak AMS liquid = ammonium sulfate from Winfield Solutions, LLC.

[e]Setfa = giant foxtail, Abuth = velvetleaf, Amata = common waterhemp, Cheal = common lambsquarters.